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THE LEATHER INDUSTRY OF THE PUNJAB.
10 FULL-PAGE PLATES, WITH MONOGRAPH BY
MR. ARTHUR J. GRANT.

RAM SINGH DEL. MAYO SCHOOL OF ART LAHORE.

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1550–1896.

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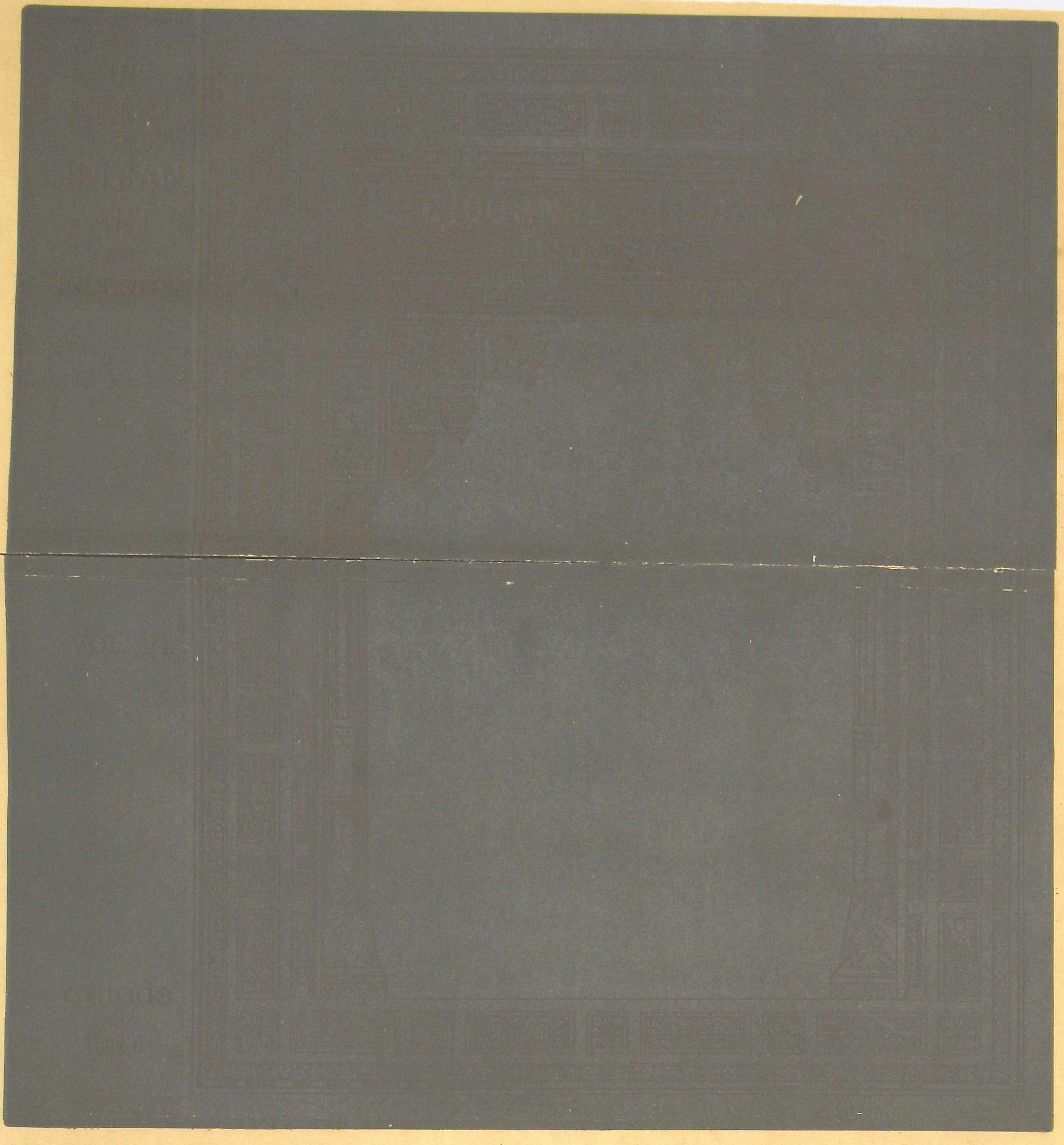

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The Journal of Indian Art and Industry.

THE MANUFACTURE OF BRASS AND COPPER WARES IN ASSAM.

BY MR. E. A. GAIT, DIRECTOR, DEPARTMENT OF LAND RECORDS AND AGRICULTURE, ASSAM.

One of the provincial peculiarities disclosed by the Caste tables prepared in connection with the last Census was the almost entire absence in the Assam Valley of the lower professional castes which are found in almost all other parts of India. This fact explains why, as has so frequently been pointed out, that portion of the province possesses no local industries of interest or importance.

It is true that in the time of native rulers some industries were fostered, and we read that the Ahom king Chu Chengpha (also known as the Burhá Raja or Pratáp Singh), who reigned from 1611 to 1649 A.D., introduced goldsmiths, blacksmiths and other artizans from Koch Bihár, and tried to induce his subjects to follow similar occupations. Some of them did so; a section of the Kacháris took to gold-washing and became known as Sonowál Kacháris; members of the Koch, Kalita and other agricultural castes became, some of them potters, others blacksmiths, and others workers in brass and bell metal; and, according to the occupation adopted, the words Kumár, Kámár and Káshár were prefixed to their proper caste names. But the time which elapsed between the date when they began to take up these trades and the occupation of the country by the British, was too short to allow of the development of any special skill, or the origination of any manufactures possessing peculiar local characteristics. When Assam became British territory, none of the occupational sub-castes, which had begun to form, had developed sufficiently to have drifted apart from the main body of the castes to which they belonged; intermarriage was still permitted between them and their caste-fellows, and there was nothing to prevent them from following agriculture as a means of livelihood, any more than there was to prevent other members of these castes from becoming potters or blacksmiths or workers in brass or bell metal.

As soon as the advent of the British opened up the province to external trade, the effects of this absence of special skill and of the want of fixity of occupation which caste scruples impose elsewhere, soon became apparent. Cheaper and better articles of foreign manufacture began to oust the local products, and most of the persons engaged in making the latter, when they found that their trade was becoming unprofitable, abandoned it, and turned their attention to agriculture. With very few exceptions, the articles which are still manufactured in the Assam Valley consist of the cheap utensils in common daily use, the making of which requires no special skill, and on which the cost of freight places imported wares at a great disadvantage as compared with those made locally.

In the Surma Valley also, although there are more persons belonging to the professional castes of the Nava Sákha group, it would seem that agriculture is generally preferred by them as a more honourable means of livelihood, and that the comparatively small numbers who still follow their traditional occupations, are unable to compete successfully with foreign manufacturers, except in regard to the cheap and common articles above referred to.

The Native State of Manipur is the only place in the province where articles of ornament as well as use are made, and even there, there is very little that deserves special mention.

So far as the character of the articles made is concerned, the above general observations apply in their entirety to the local manufacture of brass and copper wares. With the exception of Manipur, copper ware is made nowhere in the province, while brass and bell metal are only worked up into the common pots and pans in daily use amongst the people. But, even of these common utensils, the local supply is insufficient, and large quantities are annually imported from Bengal. No district in Assam is specially noted for its manufactures of this description.

The general considerations mentioned in the introductory paragraph apply also to the caste of the persons engaged in manufacturing articles of copper and bell metal in the Assam Valley districts. They are for the most part persons of the Kalita, Koch, and Kewat castes, the word Káshár being tacked on to their proper caste-name as an indication of the occupation which they follow. There is, however, no real distinction between Kalitas, Koches, and Kewats, who are Káshárs, and other persons belonging to these castes, except that the agricultural community look down on all persons following mechanical pursuits, and describe them as "Saru" or "small," while they call themselves "Bar" or "great."

The manufacture of brass utensils, on the other hand, enjoys the distinction of being the only industry of the sort which is appropriated by a particular caste. It is the traditional occupation of the Morias, who have a very peculiar history. The *Asám Buranjis* (historical narratives) state that they are the descendants of prisoners captured by the Ahoms during Turbuk's unsuccessful invasion of their territory about 1506 A.D. These prisoners, it is said, were at first employed as grass-cutters for the State elephants, but proved so useless that they were soon employed instead as cultivators, but at this work also they proved utterly useless. They were then left to their own devices, with the result that they adopted brass working as a means of earning a living, and on this occupation they are still exclusively employed. Cases in which Morias have taken to agriculture are very rare.

Owing to their isolation, the Morias gradually fell away from the observances enjoined by their religion, and a few years ago it was stated regarding them that they ate pork and drank spirits, and had given up the practice of circumcision. Of late, however, the Mullahs have been at work among them, and they are now rapidly assimilating their practices and habits of life to those of ordinary Musalmans.

The origin of their name is not certain; it may be a corruption of *mariya* (beating), a name applied with reference to their use of the hammer for making their wares, or it may be a jingling corruption of Goria, a term assumed by the ordinary Musalmans of this province as an assertion of their claim to have come originally from Gaur.

The necessity for living near their market has led the Morias to migrate a good deal, and within the last few years one colony has left Sibságar and settled in Mangaldai, and another has gone from Jorhát to Silghát in the Nowgong district. They are a very industrious people, working often till a late hour of the night, and, unlike other artizans in this province (with the single exception of the Hiras), they are aided in their work by their women.

I have no special information regarding the persons employed on this work in Sylhet and Cachar, beyond that they belong to the Kánsári caste, and differ in no important respect from the members of this caste in Bengal. Their homes are mostly in the Hábiganj and South Sylhet subdivisions, and in pargana Pánchakhanda in the Karimganj subdivision, but the chief places where they ply their trade are Sylhet town and Nijpát Jáintiápur.

In Manipur copper is worked by the Kaisám, Kángbám, and Taurángbám sections of the people; bell metal by the Ahaibám and Senjám; and brass by all the above, but principally by those mentioned as working in copper, who are also very often goldsmiths.

METHOD OF MANUFACTURE.—In the days of the Ahom kings, it is said that bell metal was made locally, but that is no longer the case; and even when it was done, the product is said to be inferior to that obtainable from Bengal. The raw material is now either imported from Bengal, or obtained by the purchase of broken or unserviceable articles made of this alloy. Bell metal utensils are manufactured by casting in moulds. They are generally made to order, and are not usually manufactured in large quantities for sale to possible customers. The chief centres of manufacture are Sarthaibári in the Barpeta, and Titábar in the Jorhát subdivision. As has already been stated, the local supply is not sufficient to meet local requirements, and importations from Bengal are considerable.

The Morias, on the other hand, never resort to casting, but make their utensils from thin sheets of brass, which they hammer out and piece together so as to obtain the desired shape. These sheets, which are imported from Europe, are purchased by them from Márwári merchants, who often sell them on credit, on the understanding that the manufactured utensils will be sold to them at a somewhat reduced rate. The following description of the instruments used by them, and the way in which they are applied, is reproduced from a Note written by Mr. Darrah in 1885:—

1. *Belmuri* (large anvil).—This is a block of iron, shaped like a short, thick, flat-topped tent-peg. The diameter of the top is about one-third the whole length. The pointed extremity is driven through a hole in a small board and into the ground below. The board keeps the anvil from being driven too far into the ground by the hammering it receives during work.

2. *Chatuli* (small anvil).—This is a bar of iron, shaped exactly like a tent-peg, with a flattish head. The pointed end is driven into the ground, and the article to be manufactured beaten into shape on the top.

3. *Dheka* (double anvil).—This is shaped like the head of a hammer, except that it is thinner, longer, and has one end pointed. The part which in a hammer is prolonged over the wood of the handle consists in the *dheka* of a point, which is driven into the ground or a piece of wood when the implement is being used.

4. *Harugara* (hammer).—It is medium-sized, with one straight and round, one curved and chisel-shaped extremity. The handle passes through a hole in the head.

5. *Patmara* (hammer).—Shaped like a pick-axe, but wlth chisel-shaped ends.

6. *Barhaturi* (large hammer).—Shaped like a *harugara*, but very much larger and heavier. The flat extremity is hexagonal in shape. It is only employed in heavy work.

7. *Galmara* (hammer).—The head is very long and thin, but the general shape is the same as the *harugara*. It is used for hammering the interior of utensils into which ordinary hammers cannot go.

8. *Mathani*.—A small thick-set hammer, with one end shorter than the other.

9. *Saráh* (pincers).—There are two kinds, one like an ordinary pair of English blacksmith's pincers, and one like a pair of sugar-tongs.

10. *Kati* (scissors).—Roughly made, and with blunt points, but strong enough to cut sheet brass.

11. *Bhati* (bellows).—These are made of goat's skin, with the hair outside. They are funnel-shaped, and the point of the funnel is connected by means of a small bamboo pipe with a narrow underground channel communicating with the bottom of the furnace. The upper part terminates in a wide mouth, formed by two slips of bamboo about a foot long. A loop of string attached to the centre of each connects the two slips of bamboo. The operator works the bellows with his left hand, adjusting the fire with a rod held in his right. The loop passes over his hand, and as he raises it with the slips of bamboo apart, air fills the bellows; the hand is then closed, thereby bringing the two slips together and pressed down, and forces the air into the furnace.

12. *Aphuri* (furnace).—This is simply a hollow in the floor of the hut.

13. *Bagi* (chisels).—These are small instruments with the extremities slightly bent, and used for cutting rings and other ornamental devices on the finished brass utensils.

14. *Mahi* (crucible).—A small gourd-shaped vessel of baked clay, about 4 inches in diameter. When in use, the mouth is covered by a little cake of clay called *maula*.

15. *Pajal* (mould).—This is a piece of baked clay, exactly like a brick, with hollows of various shapes on the surface.

16. *Naora* (a wooden trough containing water).—It usually stands close to the *aphuri*.

17. *O* (file).—Triangular and square ones are in use. The latter are made by the Morias themselves, and are very rough.

18.—*Nagara*.—A ring used in breaking up *pán* as described below.

19. *Kundha*.—This is a species of lathe, consisting of a rod of wood inserted at one end into one of the posts of the house, and at the other into a peg (*barisila*) driven into the ground. Articles which are ornamented by rings cut into the brass, are fixed on the rod with lac and turned.

Pán is the material used in joining the sheet brass where a junction is necessary. It is made by melting together three parts of sheet brass and one part of solder (*setu*). The result is a brittle compound, which is broken up into fragments on the anvil, inside the *nagara*. The *pán* will not flatten out when struck by a hammer; it breaks up. In melting the *pán*, the crucible is more than once taken out of the fire, and rolled in a heap of rice husks (*tuh*). This is said to remove all danger of the clay breaking. Goat's fat is put into the mould before the melted *pán* is poured into it. When it becomes necessary to join the two edges of a sheet of brass, nicks are cut in one edge and the other edge fitted into these, and the two beaten flat. Then a rough paste is made of some broken-up *pán* and borax (*soyaga*), which is smeared over the joining. The junction is then heated; the *pán* melts, and the union is cemented.

In the Surma Valley, as in the Assam Valley, brass utensils are invariably made by hammering out thin sheets of the metal, which are imported from Calcutta either by the braziers themselves or through *aratdars* (commission agents). Bell metal utensils are cast.

In Manipur also, the usual manner of working brass is that described above. The two clans (Ahaibám and Senjám) who work chiefly in bell metal are reported also to cast brass, but they do very little work in this metal. The raw material, of course, is imported.

The manner of making bell metal utensils, which are manufactured by the two clans just mentioned, is described by the Political Agent as follows:—

A solid mould of clay and rice-husks, after being turned to the required shape in a lathe, is burnt. It is then coated with wax, which, being well smoothed and daubed over with a mixture of reed ash and earth, is itself coated over with a layer of clay and *bhusi*. This is dried, but not burned in the fire, and after the wax has been melted out by the application of heat, the molten bell metal is poured into the now empty space which the wax occupied. The vessel, after cooling, is extracted from the earthen mould, and is turned in a lathe and polished.

The material, presumably, is imported, and so also is the copper, which is worked by the Kaisám, Kángbám, and Taurángbám sections. An attempt was made by one of the Maharajas to work the copper which is found in the hills on the east of the State near Tammu, but the metal produced was of inferior quality, and the idea was consequently abandoned.

The following is a list of the different utensils manufactured from brass, copper, and bell metal:—

ASSAM VALLEY.

BRASS.—Berha: a tripod consisting of a ring about a foot in diameter, supported on three hollow legs, the interior of which is filled with pieces of broken brass, which produce a jingling sound; the tripod stands about 14 inches high, and is used to support the flat dish out of which an Assamese of the better class eats his rice. [see Pl. 6]. Chaki: a lamp, or rather brass stand, with an open cup-shaped vessel at the top, which is used for holding oil. The wicks are simply threads of cotton laid across the ends, projecting beyond the edges of the cup [see Pl. 6]. Chariya: used as a wash-hand basin, and sometimes also as a receptacle for sundry articles; the same as the *tagar* of the Surma Valley; also made of bell metal. Don: a measure holding five seers [see Pl. 7]. Ghagari: a decanter-shaped vessel with an ornamented top, formed of 8 pieces of brass, and used for keeping and carrying water in [see Pl. 7]. Ghati: a small jug. Ghochha: a lamp stand. Kalah or Kalsi: this is exactly like the *ghagari*, except that it is provided with a brass rim round the bottom to enable it to be placed upright; the top is sometimes ornamented and sometimes plain; also made of bell metal and copper; those of copper are used for holding water

for religious ceremonies; the same as the *kalsi* of the Surma Valley and the *tukna* of Manipur. Karia: milking-pot [see Pl. 7]. Kharahi: a sieve used for rinsing rice; the same as the *jhanjri* of the Surma Valley. [see Pl. 8]. Khundana: something like an elongated thimble, used by old people for pounding *pán* and betel-nut so as to facilitate mastication. Lota: a sort of small jug used for holding water, and also as a drinking vessel; the same as the *lota* of the Surma Valley and the *khujai* of Manipur; also made of bell metal. Sarai: a round tray used by Hindus for carrying rice, pulse, fruit and other articles when making religious offerings; also made of copper. [see Pl. 8]. Seta: a large spoon with a handle, thin towards the bowl and thick towards the opposite extremity, used in distributing rice and curry; the same as the *hata* of the Surma Valley. Tema: a small round box in which areca nuts are kept; the same as the *dibi* of the Surma Valley; also made of bell metal. [see Pl. 5]. Temi: a box smaller than the *tema*, in which the lime eaten with the betel is kept; the same as the *chunati* of the Surma Valley; also made of bell metal. [see Pl. 8]. Thali or Jhaka: a large boiling vessel. Tou: a basin-shaped vessel generally used for cooking food and boiling paddy, and sometimes also for keeping various things, water, paddy, &c.; the same as the *tasla* of the Surma Valley.

BELL METAL.—Banbati: a cup joined to a circular rim at the bottom, for holding curry. [see Pl. 3]. Banthal: a concave-shaped round dish, joined to a circular rim at the bottom, for holding rice. [see Pl. 4]. Barkah: a gong. Bati: a cup for holding curry, &c.; the same as the *bati* of the Surma Valley and the *tengkot* of Manipur; also made of copper. Bota: a flat circular basin with raised edge (generally ornamented) joined to a circular rim at the bottom, for holding betel-nuts. [see Pl. 4]. Dog-dogi: similar to a *lota*. Kahi: a flat circular basin with a raised edge, for holding rice; the same as the *thal* of the Surma Valley and the *pukam* of Manipur. Maipong: the same as the *banthal*, with the addition of a cover. Pandhoa: a flat basin with ornamented raised edge, for holding rice. [see Pl. 4]. Pikdan: a spittoon; the same as the *kwasen* of Manipur. Tal: cymbals; the same as the *karatal* of the Surma Valley and the *kardan* of Manipur. [see Pl. 5].

SURMA VALLEY.

BRASS.—Bata: a shallow pan for holding betel-leaf, areca nuts, &c. Dabar: a wash-hand basin. Deg: used for cooking rice, &c.; same as the *deg* of Manipur. Hata: a large spoon with a handle, used in distributing rice and curry; same as the *seta* of the Assam Valley. Jhanjri: a sieve for cleansing rice; same as the *kharahi* of the Assam Valley. Kalsi: a large jug for carrying water; same as the *kalah* of the Assam Valley and the *tukna* of Manipur. Lota: a small jug used for holding water, also as a drinking vessel; same as the *lota* of the Assam Valley and the *khujai* of Manipur. Modhara: a pot with a narrow neck, used as a still by the inhabitants of the Khasi and Jaintia Hills; imported from Sylhet. Tagar: a sort of wash-hand basin; same as the *chariya* of the Assam Valley. Tasla: a basin-shaped vessel used for cooking food, &c.; same as the *tou* of the Assam Valley. Thal: a dish for holding rice and curry; same as the *pukam* of Manipur and the *kahi* of the Assam Valley.

BELL METAL.—Bati: a cup; same as the *tengkot* of Manipur and the *bati* of the Assam Valley; also made of brass. Batlai: a vessel for cooking rice, used by Hindu widows of the better class. [see Pl. 2]. Chunati: a small round pot with a cover, in which the lime eaten with the betel is kept; the same as the *temi* of the Assam Valley; exported to the Khasi and Jaintia Hills. [see Pl. 2]. Dibi: a small round pot (larger than the *chunati*) with a cover, in which prepared betel is kept; the same as the *tema* of the Assam Valley. [see Pl. 2]. Hukar khol: used for mounting cocoanut *hukas*. Karatal: flat round plates (cymbals) with a hole in the centre, through which a string is passed; used at *sankirtans* (hymn songs) as a musical instrument; the same as the *kardan* of Manipur and the *tal* of the Assam Valley.

MANIPUR.

BRASS.—Deg: used for cooking rice, boiling water, &c.; the same as the *deg* of the Surma Valley. Khujai: a small jug used for holding water, and also as a drinking vessel; the same as the *lota* of the Surma and Assam Valleys; also made of bell metal. Korphu: a cooking pot; also made of bell metal. [see Pl. 1]. Pukam: a dish; the same as the *thal* of the Surma Valley and the *kahi* of the Assam Valley. Tengkot: a small cup; the same as the *bati* of the Surma and the Assam Valleys; also made of bell metal. Tukna: a large jug for carrying water.

BELL METAL.—Kardan: cymbals; the same as the *karatal* of the Surma Valley and the *tal* of the Assam Valley. [see Pl. 1]. Kudai Sel: an ewer. [see Plate 1]. Kwasen: a spittoon; the same as the *pikdan* of the Assam Valley. Senka: a *pán*-holder.

COPPER.—Kushi: a sort of spoon to hold water at *pujas*. [see Pl. 1]. Tami: a cup for holding water at *pujas*. [see Pl. 1].

The information available regarding the profits of the business are very meagre. Workers in bell metal are said to be able to turn out from 1 to 1½ maunds of utensils monthly, the wholesale selling price of which varies from Rs65 to Rs130 per maund, and the retail from Re.1-12 to Rs3-8 a seer. Their income is estimated at from Rs30 to Rs80, but this seems excessive.

The cost of the brass sheets used by the Morias in Dibrugarh is said to be 14 annas per seer, and the retail price of the manufactured articles from Re.1 to Re.1-1 per seer, if sold to Márwáris, and Re.1-2 if sold to the public. According to another estimate, the Morias buy their brass at Rs30 to Rs40 a maund, and sell their manufactured articles at Re.1-8 a seer, or Rs60 a maund. It is said that they can manufacture on the average two maunds weight of utensils a month. Consequently the smallest estimated monthly profit is Rs.16 and the highest Rs.60. The real income probably approximates more nearly to the former than to the latter figure. There is a certain amount of expenditure on implements and charcoal—especially the latter, except in jungly places, where the braziers make their own.

THE MANUFACTURE OF POTTERY IN ASSAM.

By Mr. E. A. GAIT, Director of Land Records and Agriculture, Assam.

There is an almost entire absence in the Brahmaputra Valley of the lower professional castes which are found in other parts of India. In the later days of Ahom rule, artizans were introduced from outside, and efforts were made to induce the people to learn different handicrafts. Some of them did so, especially people of the Kalita, Kewat and Koch castes, and the occupations thus adopted were gradually becoming hereditary, and functional endogamous sub-castes were slowly being developed, when the annexation of the country put a stop to the process. Thus, not only are there no regular professional castes engaged in the manufacture of pottery, brass-ware, &c., but the sub-castes who follow these occupations do not look on them as their only source of livelihood, and follow the ordinary agricultural avocations of the people, as well as the special handicraft which they have inherited from their ancestors.

There are two distinct classes of persons engaged in the manufacture of pottery in the Brahmaputra Valley, the Hirás and the Kumárs. (The word "Kumár" is derived from "Kumbhakár," and means "maker of pots.") The former were originally Chandáls, and, of all the functional sub-castes, they approach most nearly to the position of a separate caste. There is, however, no doubt of their close connection with the Chandáls: they still intermarry with them; they eat food cooked by them; they have the same *Patit* or *Barna* Brahmans as their *Purohits*, and they have no scruples in the matter of selling fish themselves.

The word "Kumár," on the other hand, so far as the Brahmaputra Valley proper is concerned, is not used to denote persons of any particular caste or sub-caste, but is applied to persons of several different castes (chiefly the Kalita, Kewat, and Koch) who make, or whose ancestors are remembered to have made, articles of earthenware. Thus, there are Kumár Kalitas, Kumár Kewats, and Kumár Koches, and the people so designated continue to retain their old caste status. (In Goálpára the Kumárs form a distinct caste, as in the Surma Valley). Within the caste, they rank equally with persons belonging to other functional subdivisions (*e.g.*, the Kámárs and Káshárs), but below those members of the caste whose occupation is said to have always been purely agricultural; the distinction, however, is by no means well marked amongst the Kewats and Koches, and is not a very firm one, even among the Kalitas in the western portion of the valley. A well-to-do Kumár Kalita of Kámrup or Mangaldai would have very little difficulty in obtaining a Bar Kalita bride, and his descendants would probably, in course of time, succeed in obtaining recognition as the equals of Kalitas who had never followed other than purely agricultural pursuits. Higher up the valley, it is said to be much more difficult for a Kumár Kalita to raise himself to the status of a Bar Kalita.

In a few rare instances, persons other than Hirás and Kumárs are found manufacturing earthen vessels in the Brahmaputra Valley. In the Tezpur subdivision a few Doms make large earthen pots, which are used for boiling *gur*; they rank equally with other Doms, and only make these utensils as a secondary occupation, their main means of livelihood being the catching and selling of fish. Near Dibrugarh, some few families of up-country men from Arrah are potters by profession. They are known locally as Hirá Kumárs. Some up-country potters have settled recently at Golághát.

In Sylhet and Cachar, the word "Kumár" denotes, what it does in Bengal, the separate potter caste, *i.e.*, one of the nine professional castes (Navasákha), which are said, according to the commonly-accepted Hindu tradition, to be descended from the offspring of Visvakarma, the divine artizan, by a Sudra woman. Members of the caste rank as Sudras, and Brahmans will take water from their hands and serve them as their priests. The Kumárs sometimes call themselves Rudrapál, in vindication of their claim to be descended from the beads of Mahádeva (*Rudráksha*). Some members of the caste go still further, and, dropping the Rudra, say that their proper appellation is Pál, or Kayastha.

Besides the Kumárs, there are in Sylhet some Musalman potters, locally known as Khuskis, who prepare the plates called *sának* for their co-religionists. The Khuskis are said to be endogamous; they are looked down on by ordinary Musalmans, just as are Máhimals or Muhammadan fishermen.

In the Garo Hills, pottery is made by persons of the same caste as the Kumárs of Sylhet; in the Khási and Jaintia and the Nága Hills districts the caste system is unknown, and there the business is carried on by any one choosing to learn the work.

In Manipur, the persons engaged in the manufacture of pottery are known as Luis, who are said to be the descendants of Kabui Nágas. Their status is below that of ordinary Manipuris, but there is no perceptible difference in their habits or manner of life. The articles manufactured in this province are not of any special interest, and consist chiefly of the rough utensils in common daily use amongst the people. The earth used is

generally a glutinous clay (*atha mati* or *alatiya mati*), but information on this point is not very precise or satisfactory. That used by the Kumárs of the Brahmaputra Valley is of a dark-blue colour, and is known as *kumar mati*; it is procurable without much difficulty in most parts of the country,—usually on the banks of streams. The Hirás use a peculiar kind of clay, which is more rare, and it is reported that in the whole of the Kámrup district there are only two places (Molong and Agiathuli) from which it can be obtained. This clay, which is called *hira mati*, is of a gray colour, and is very stiff; owing to this fact it makes better earthenware than the *kumar mati*, but the Kumárs do not use it, as it is not easily worked into shape on the wheel. The Kumárs sometimes use it mixed with *kumar mati* for making well rings, which are shaped, not on the potter's wheel, but on a form. The up-country potters of Dibrugarh are said to get their earth from ant-hills (*haphalu*).

In the Surma Valley and the Gáro Hills, the earth used is generally known as *murha* or *athali mati*,—*i.e.*, a stiff clay; but for some utensils, which do not require any very great strength, a lighter kind of clay, called *kali mati*, is made use of. The potters of the Jaintia Hills use two kinds of clay mixed,—one is of a dark-blue colour (*khyndew-iong*) and the other grayish (*khyndew-khluid*); these clays seem to correspond closely with the *kumar mati* and the *hira mati* of the Brahmaputra Valley. The Nágas use a bluish-black earth, called in Angami Nága *khegsa*, which is probably the same as *kumar mati*. In Manipur, as in the Khási and Jaintia Hills, two kinds of clay are mixed. One of these is black, and is called by the Manipuris *leital*, and the other is of a light-red colour, and is known as *leicheng;* four parts of the former are used to one part of the latter.

The clay is in all cases first well moistened in water, and all extraneous substances are carefully removed. Where two different kinds of clay are combined, they are mixed together very carefully. If the clay is of a very stiff nature, a certain amount of clean coarse sand is worked up with it. One object of adding the sand is said to be in order to prevent the articles made from cracking when being burnt in the kiln. In some cases, the pieces of old utensils powdered up, ashes, paddy husks, or some sort of fibre chopped up into small pieces, are mixed with the clay to add to the strength of the utensils made from it. In all cases, the clay is thoroughly broken and worked up, the feet being largely used in the process.

Method of Manufacture.—The Kumárs of both valleys use the potter's wheel for roughly shaping all the articles made by them, except well rings and flat or saucer-like utensils. A moistened and well-kneaded lump of clay is placed on the inner disc of the wheel, which is fixed horizontally, and is made to rotate rapidly. As the wheel revolves, the workman moves the lump of clay about on the disc, and gives it the desired shape. The superfluous clay is then cut off with a string, and the vessel is sun-dried for a time. When it has somewhat hardened, it is placed in a hollow mould made of wood or earthenware, which is sprinkled with sand to prevent the vessel from sticking to it, and is then made to assume its final shape by hand. The method adopted is to beat the exterior surface of the vessel with a flat wooden or earthenware mallet, held in the right hand, against a smooth, oval-shaped stone held by the left hand against the inner surface. When the required shape has been given to the vessel, it is again sun-dried, and the surface is then polished with a sort of earthenware pestle or (in Manipur) a piece of strong rag folded and moistened with water.

They are then sometimes coloured with red dust or cattle urine, after which they are ready for the kiln. In the Khási and Jhantia Hills the colour is given by a decoction made from the wild date pine, after the vessels have been taken out of the kiln, and while they are still hot. Flat articles made by Kumárs, such as plates, &c., and all utensils manufactured by the Hirás of the Brahmaputra Valley and the potters of the Khási and Jaintia and Nága Hills districts and Manipur, are roughly moulded on a flat disc of wood, and not on the wheel. The subsequent operations are the same as those already described. In the case of articles with narrow necks made by the Hirás, the practice is to make them in successive layers, each layer being partially dried before the next is added.

The following is a list of the rough implements used, with a description of each:—

1. The potter's wheel.—Assamese, *chak*; Bengali, *chak*. The diameter of the whole wheel is usually rather more than 3 feet. In the centre is a solid disc of tamarind or some other hard wood, some 13 inches in diameter, to which the outer rim is joined by four wooden spokes, each of which is about 6 inches in length. The outer rim, which is about 6 inches broad, is made of split bamboos, bound with cane and covered with a thick plaster of clay mixed with fibres of the sago palm (*chaur*); the object of this rim is to increase the weight of the wheel and thereby add to its momentum. An upright piece of *Nagesvar* wood (*Mesua ferrea*) or *khair* (*Acacia catechu*), about 6 inches in length, supports the wheel; it is fixed firmly in the ground and is pointed at the upper end, so as to enable the wheel to revolve freely; a hollowed-out stone is let into the centre of the disc, where it rests on the point, so as to reduce the friction to a minimum. As already stated, the wheel is worked by hand, and revolves horizontally, the clay to be moulded being worked into shape on the disc as the wheel rotates. The earth under

the wheel is generally scooped away, so that the upper surface of the wheel may be on a level with the ground, on which the operator sits.

2. The rolling board.—Assamese, *aphari*; Bengali, *athal*; Manipuri, *kangoi*. A flat board, or earthenware tray, on which utensils are roughly shaped when the wheel is not used.

3. The mould.—Assamese, *athali*; Bengali, *athali*. A hollow sort of basin made of earthenware, about 16 inches long and 3½ inches deep, in which the final shape is given to all articles of earthenware, whether originally shaped on the wheel or on the rolling board.

4. The mallet.—Assamese, *baliya piteni*; Bengali, *baila*; Khási, *tyrnem*; Manipuri, *khuyaijei*; Nága, *jivu*. From 6 to 12 inches in length, used for beating the clay into its final shape against a stone held on the other side. It is made either of wood, stone, or earthenware. This implement is sometimes also used when kneading the clay before working it into shape.

5. The polisher.—Assamese, *chaki*; Bengali, *chaki*. Used for polishing the articles made, after they have attained their final shape and been partially dried.

6. The kiln.—Assamese, *paghali*; Assamese, *pain*. This is used by the Kumárs of the Surma Valley, and by some of those in the Brahmaputra Valley. The Hirás and others burn their earthenware in the open. In both cases alike, the vessels are carefully stacked, with layers of straw between them, and firewood or cowdung as fuel underneath. In the Brahmaputra Valley a stack of utensils is called a *thupa*.

The collection of the clay and firewood, the stacking of the utensils in the kiln or *thupa*, and the rough shaping of utensils on the wheel, form the men's portion of the work. The final shaping and polishing of the utensils is always done by the women, and when the wheel is not used, as with the Hirás, the rough moulding is also done by them.

The general opinion of the officers consulted is that the profits of the business are very small, the average earnings being placed at from Rs.4 to Rs.6 a month. It is difficult to estimate the exact earnings, as no accounts are kept by the potters, and they generally prefer to barter their wares in exchange for rice or paddy, instead of selling them for a fixed price. There is, however, no doubt that the earnings are less than they were some years ago. Brass cooking utensils are cheaper than they were formerly, and the standard of comfort of the people is improving, so that brass vessels are in most parts supplanting those made of clay. In Sylhet, the better class of Musalmans are taking to china instead of earthenware; and throughout the province, tin lamps and kerosine oil are taking the place of earthen *chakis* and mustard oil. Owing to these causes, the demand for earthenware articles is gradually falling off, while the trade is also depressed by the competition of foreign wares of a better quality, which are brought up in large quantities from Eastern Bengal, and more especially from the Dacca district. The decadence of the industry is not much to be regretted, as the articles made are of a very rough character, and less durable than those imported from Bengal, and the people who make them in this province are not inclined to learn improved methods.

The following is a list of the more important earthenware articles manufactured in Assam:—

BRAHMAPUTRA VALLEY.

Adkalah: small *kalah*; the same as the *hachi* of the Surma Valley. Akasbati: lamps used at marriages and on other festive occasions—*e.g.*, at the Dewali festival. Akathia: cooking pots, same as *dukathia*, but smaller in size; used for cooking rice or curry. Banmala: a *mala* (vessel) with a rim, in which curds, sugar, &c., are kept. Bhuruki: same as *mathia*, but smaller in size; used for storing grain. Chakali or Paticharu: these vessels are used for cooking curry; the difference between a *charu* and *chakali* is that the former is hollow, while the latter is less so, and flattened. Chaki: an earthenware lamp, with an open mouth, on which the wick lies; mustard oil is usually burnt in these lamps; the same as the *chata* of the Surma Valley. Charakdan: a hollow cylinder, about 20 inches high, used as a candlestick; the same as the *bogna* or *pradiper gacha* of the Surma Valley. Chilim: these are of two kinds, viz., *dhopat-khoa chilim* and *bhang-khoa chilim*—one is used for smoking tobacco and the other for *ganja*; the two are slightly different in shape at the top; those used for smoking tobacco are larger than those used for smoking *ganja*; the same as the *kalki* of the Surma Valley. Charu: same as *thali*, but of medium size; used for cooking rice; they are in use among the poorer classes who cannot afford to buy iron or brass utensils. Dama or Daba: earthen rings, on which hides are fastened to make drums. Daskathia: used for cooking rice, and intended to hold food for three or four persons. Gacha: a lamp stand. Ghat: water-pot used in *pujas*; the same as the *ghat* of the Surma Valley. Handi or Hari: a wide-mouthed pot largely used by Kacháris for cooking rice and brewing *mad*; the same as the *patil* of the Surma Valley. Jang: somewhat similar in shape to the *handi*, but longer; it is used by Kacháris for keeping water and *mad*. Juidhara: fire-stove. Kalah: a decanter-shaped vessel, chiefly used for holding water; also used for holding milk, *gur* (molasses), oil, &c.; the capacity is from 4 to 5 gallons; the same as the *kalas* of the Surma Valley. Khampti Haria: manufactured after a model given by the Khamptis for cooking their rice over steam; it is a drum-shaped pot, perforated at the base, and placed over another basin in which the water is boiled. Khola: resembles in shape a kalah, with this distinction—that it

has a wider mouth and neck, and is not quite so high; this vessel is generally used for cooking rice. Mala: a small *charu* used in religious ceremonies; the same as the *malsa* of the Surma Valley. Mala Charu: small trays for distributing eatables during festivals. Mathia: a large oval-shaped pot, with a comparatively narrow mouth, used for storing grain, and sometimes as a box in which clothes are kept; when used for the latter purpose, the mouth is closed by a cover, which is pasted over it. Mridanga or Khol: drums, larger than the *dama*, but made in the same way. Nad pat: well ring; the same as the *pat* of the Surma Valley. Nadia: a basin, something like a *charu*, but has a rim, and is stronger; used for keeping sweetmeats in. Nagara: small drum. Phuldan: flower vase. Piala, Beria, or Deg: a shallow "*khola*," with a much wider mouth; the neck is shorter than that of a "*khola*"; it is used for cooking purposes, as well as for keeping curds, salt, molasses, &c. Satar: same as *daskathia* and *akathia*, holding food for one person only. Sarai: a kind of tray on which presents are offered. Tekeli or Bhetua: the same shape as the *kalah*, but much smaller; holds from 2 to 4 quarts. Thali: big pots for preparing molasses, and also used for storing up water and cooking food in feasts.

SURMA VALLEY AND GARO HILLS.

Badka: a small jug used by Muhammadans instead of a *lota*. Bhetua: small earthen pot, used for cooking and other purposes. Bogna or Pradiper-gacha: stand for *chata*; the same as the *charakdan* of the Assam Valley. Chata or mallika: open lamp; the same as the *chaki* of the Assam Valley. Chilim or kalki: used for smoking purposes; the same as the *chilim* of the Assam Valley. Dhakna: a kind of plate or cover. Galas: a drinking-cup. Ghat: small pot for holding water, also used in Hindu ceremonies; the same as the *ghat* of the Assam Valley. Hachi: small *kalas*; the same as the *adkalah* of the Assam Valley. Kalas: a large jug for carrying water; the same as the *kalah* of the Assam Valley. Kasla or Dema: big earthen pot, used for cooking and other purposes. Kasi or Kai: a large plate. Khada: a kind of cup. Malsa: a kind of cup; the same as the *malah* of the Assam Valley. Pat: well ring; the same as the *nad pat* of the Assam Valley. Patil: small pot used for cooking and other purposes; the same as the *handi* of the Assam Valley. Piala: cup. Sharah: a kind of plate used as a cover. Sanak: a kind of plate used chiefly by Muhammadans to eat rice on. Sarai: a kind of jug for holding water. Tari: a small plate.

NAGA HILLS.

Li: this is the same in shape as the *likuno*, but larger, and is used chiefly for cooking rice. Likphu: this resembles a vase in shape, with a long contracted neck, terminating at the mouth in a fairly broad lip or flange; it is only used to carry water into the village; it ranges from 18 inches to 2 feet in height, and from 9 to 12 inches in diameter. Liki: this is of the same shape as the *likphu*, but larger; it is used only for the preparation of rice beer or "*zu*." Likuno: this is about the size and shape of the ordinary brass *lota*, but having proportionately a larger mouth; it is used for cooking vegetables, &c. Setuli: a kind of earthern *korai*, used for roasting seeds, measuring from 10 to 20 inches in diameter. Tatseli: this is of the same shape as *li*, only larger in size, some being as much as 18 inches in height, and of about the same diameter.

KHASI AND JHANTIA HILLS.

Khewranei: *chattis* or *gharas*. Khew syntiw: flower pots. Kum: *gharas*.

THE LEATHER INDUSTRY OF THE PUNJAB.

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I. LEATHER-WORKING CLASSES—STATISTICS OF TRADE, &c.

The profession of working in leather, always unsavoury, is considered in India to be particularly unclean, and the persons engaged in this occupation have at all times in its history been looked down upon as a degraded class, in some cases actually outcast and excluded from participating with others in the rites of their nominal religion, and in other cases only admitted on sufferance to do so. Although it is impossible to trace with any certainty the origin and history of the class of leather-workers, still we can find out something as to their state and position in old times. At the period of the Institutes of Manu the rigidly exclusive principles of caste, as it became later on, were not yet established. There were, however, the divisions of the people into Brahman, Kshattriya and Vaisya (all pure Aryans), and the fourth class of Sudras which included aboriginal tribes and descendants of mixed marriages between the Aryans and the aborigines. In this four-fold division undoubtedly no one above the rank of a Sudra would have followed such a dirty and unpleasant occupation as working in leather. It is probable that the persons who actually undertook this kind of work belonged partly to aboriginal tribes and partly to the lowest class of descendants from mixed marriages. In the Institutes of Manu an attempt is made to trace the class of workers in each industry back to some particular hereditary origin. The class of 'káravaras' or leather-workers was held to be the issue of the mixed marriages of 'nishádas' with 'vaidihas,' thus representing a mixture of Brahman, Vaisya and Sudra. This derivation is of course merely fictitious, but it serves to show that leather-workers then, as now, belonged to a despised section of the community. Their humble descent and the degrading nature of their occupation combined to bring the 'káravaras' down to a very low position on the list of castes given in the Institutes of Manu, the only classes considered inferior to them being 'halálkhors,' 'chandáls,' sweepers, executioners, and 'cannibals.' In spite of their low rank, however, it is interesting to note that the annals of mediæval Hinduism afford an instance of a member of this class being singled out for individual distinction in the faith. This was Rai Dás, a Chamár, who was chosen as one of the twelve disciples of Rámanand and is revered as such by the Rámanandi sect of the Vaishnavas, while the Raidásís called after him are still the principal division of the Chamár caste.

After the time of Manu, the caste system became rigid and the leather-workers were stereotyped into a despised and outcast section of the community bound by blood and descent to a hereditary profession which was regarded as degraded and impure. Since then, however, caste organisation has again undergone great changes, and at the present time, though leather-workers continue to be looked upon as a low and menial class, still they share in common with all other ranks, in consequence of the relaxation of the rigidity of the old caste system, the possibility of raising themselves either individually or as a class to a higher position in the social scale. Caste was based at first upon the principle of community of blood. Then the principle of common occupation was recognised. Thus certain persons came to form a certain caste because they were engaged in the same occupation, not because they they were of the same real or nominal descent. But there still remained the notion of the hereditary nature of occupation, and until this was done away with, and while it was thought that the son of a tanner must necessarily be also himself a tanner, the bounds fixed to castes were as rigid and immutable as under the old fictitious theory of common descent. Eventually this last idea of the heredity of occupation also became relaxed, and now it is possible within certain limits for individuals or whole castes by changing their occupation and manner of life to remove themselves gradually from one rank to another and improve their position in the community. In the case of leather-workers, however, there are other obstacles which stand in the way of any attempt to rise in social rank, and which are the more difficult to be overcome as they are connected with religious prejudices which are so powerful in the East. Chamárs are impure in the sight of Hindús because they eat the flesh of cows and dead animals and work in leather, which is unclean; and the Sikhs, who are even stricter in their reverence for the cow than the Hindús, exclude them on the same grounds. But in spite of these difficulties the modern principle of the mutability of caste has extended even to the case of these classes. In the Punjab Census Report for 1881, Mr. Ibbetson says: "Among the artisan and menial tribes, the process (of changing occupation and with it caste) is common. One Chamár takes to weaving instead of leather-working and becomes a Chamár-Juláha; presently he will be a Juláha pure and simple; another does the same and becomes a Rangreta or a Bunia." The religious difficulty does not stand in the way nearly so much in the Western Punjab, and especially the North-West Frontier, where the population is Mussalmán, as it does in the East and South-East Punjab, where the people are nearly all Hindús. And it may be noticed that in some parts of the Frontier, as Dera Ismail Khán, leather-workers from down-country who have settled there have taken tone from their surroundings, and though they were originally Hindús have now nearly all become Mussalmáns. Changes in caste

among Mussalmáns represent little more than changes in social position, and are not accentuated by religious considerations. On this point Mr. Ibbetson writes: "In fact the difference between a Pathán who took to weaving on the frontier and a Rájpút who took to weaving in the Delhi territory would be precisely that between caste in India and social standing in Europe. The degradation would not in the case of the former be ceremonial or religious, nor would it be hereditary, save in the sense that the children would be born in a lower condition of life; but the immediate and individual loss of position would be as real as among the strictest castes of the Hindús. Thus we find men on the frontier of all castes engaging from poverty or other necessity in all occupations except those of an actually degrading nature." It is, however, noticed in a report now received from the Kohát district that Patháns who have taken to leather-working, though they retain the name of Pathán, are not able to intermarry with other Patháns who have not been connected with a menial occupation of this kind. In all parts of the Punjab there is undoubtedly growing up the modern feeling of toleration which recognises prosperity and allows respect to wealth wherever it may be found, and in Lahore and other places the heads of native firms of saddlers or shoe-makers, who are in a good way of business, enjoy a considerable degree of social position. A native Extra Assistant Commissioner gives a fancy picture of the rise in the social scale of a Mochí's family in the Punjab. He becomes well-to-do and calls himself a Khoja: his son gets on well at school: so the father, besides leather articles, keeps in his shop other small things such as pens, paper, knives, &c., and the boy is called "son of a merchant": the son passes his examination and becomes a "sheikh": now the father drops shoes altogether and sells a better class of article or turns contractor: and the son finally gets himself called "Khán Sáhib" and soon blossoms out into a "Sayyid," whose ancestors came from Afghánistán with Mahmúd of Ghazní.

INTERNAL TRADE.—The table given below shows the total figures for internal trade of the Punjab with other parts of India during the three years 1890—93 :—

	1889—90.		1890—91.		1891—92.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Dressed hides	179,056	351,432	153,637	252,296	64,541	865,898
Raw hides	368,972	362,780	258,141	363,834	234,228	540,540
Dressed skins	94,129	1,283,300	63,989	1,695,928	58,266	1,286,910
Raw skins	141,056	1,137,074	123,081	805,105	193,726	1,326,782
Total	783,213	3,134,586	598,848	3,117,163	550,761	4,020,130
Manufactured Leather ...	804,337	871,024	820,209	2,041,050	1,166,284	2,633,700

II. LEATHER—PREPARATION AND MANUFACTURE.

The skins ordinarily used for tanning in the Punjab are those of the buffalo, bull or cow, sheep and goat. Besides these the skins of horses, asses and camels are sometimes worked up; and in special parts the skins of other animals also, such as the wild cat, fox, snow leopard, grey and brown squirrel, jackal, bear, karth, gural and barking deer, are occasionally made use of.

Buffalo hide is most esteemed for its strength. It is very durable, but it is too thick and stiff to be suitable for all kinds of work. It is most used for the thick soles of country-made shoes, and together with ox hide is also employed in harness-making and saddlery, in the manufacture of huqás, khopás, nárás, tobras, charsahs, petís, bokas, &c. Buffalo hides raw cost between Rs.4 and Rs.6, and when dressed they are worth Rs.5 to Rs.7. When sold by weight the raw hide fetches from Rs.10 to Rs.18 per maund, the price being less in the hot than in the cold weather, as the tanning is not then so certain. The following passage is extracted from a note on the Cawnpore Government Tannery :—

"Buffalo is the only available hide that will produce leather thick enough for harness work in this country; but there is no doubt that much of the inferiority of country leather arises from the poorness of the skin of that beast. It is poorly fed, not generally cared for, and usually killed when too old to breed or give milk. The hide of the male buffalo is too coarse and it gets such bad treatment in the plough or cart that it is generally full of sores and goadmarks. In large towns there is a market for buffalo beef for the low caste and poorer Mussalmán population, and also for grease, but the younger and better cattle are rarely slaughtered; it is from these slaughtered animals that the local tanners select their hides for the finer uses of harness, saddlery, and accoutrements. Many good hides are ruined by butchers in flaying from inefficient arrangements in the slaughter houses and from injudicious use of their tools."

The skins of bulls and cows are called 'goká.' The leather made from them is not quite so strong as buffalo hide leather, but is stout enough for most purposes. Raw skins of this kind fetch from Rs.2 to Rs.5, being on the whole slightly less valuable than buffalo skins. Dressed they are worth from Rs.3 to Rs.6 each. There is

sometimes a distinction made between the skins of bulls and cows, the former being considered tougher and rather more valuable. This class of hides is much exported to England and extensively used there for boot and shoe upper leather, for which it is much esteemed. Much damage is done to the hides by branding on the butts and shoulders.

Sheep skins are called 'meshá' and goat skins 'khal,' or together they go under the generic term of 'nárí.' The leather made from them is much finer and more supple than that from buffaloes' and bulls' hide, and is used for such purposes as making uppers of shoes, covering boxes and wicker work baskets, making bellows, stockings, gaiters, and book binding. Goat leather is esteemed much the more highly of the two, as it is stronger and more durable. Sheep and goat skins are bought up largely from village butchers and sweepers by the Khatíks who, as already noticed, are a special class whose occupation consists in the tanning of these kind of skins. They are also sold in considerable quantities by butchers to merchants from Delhi, who purchase them for the home market. The value of a raw sheep skin is from 6 annas to 12 annas, and when tanned they fetch only from 8 annas to Re.1 each. Goat skins are worth from 10 annas to Rs.1½ raw, and from Re.1 to Rs.2 when dressed. In Láhaul, where sheep are very plentiful, a prepared sheep skin is worth only 4 annas.

Of the other skins which are less commonly used camel skins are employed principally for making 'kuppás,' stout leathern jars, or for patching up holes and weak spots in other kinds of hides. For this purpose they are not regularly tanned. The skins are worth from Re.1-8 to Rs.3 only. They are also exported from some districts of the Punjáb to Lahore and Amritsar, where they are said to be used for packing tea exported for the Central Asian market. Horses' skins are said to yield a very thin and weak leather and are very seldom worth the trouble of tanning. They are worth from Re.1 to Rs.2 only in their raw state. Asses' skins fetch from 8 annas to Re.1 when raw. They are seldom tanned locally, but are sometimes sent to Delhi and Pesháwar, where they are made into shagreen. Deer skins are worth from 6 to 8 annas; leopard and bear skins from Kulu and Kángra about Rs.2-8 and Rs.1-8 respectively; barking deer about Rs.2; gural Rs.2; and karth Rs.3. These latter all come from Kulu. In Pesháwar are to be had wild-cat skins (known as 'soghar' and 'samor'), and fox skins (sháhzáda), many of which come from Russia. Here also snow leopard skins and skins of the grey and brown squirrel are sometimes brought in from Kábul. Foxes' and jackals' skins are sent in some quantities from Ráwalpindi to Pesháwar to be dressed there. Scented "Russia leather" is also to be obtained at Pesháwar at a price of Rs.20 to Rs.30 per skin, but it is not a local product.

The skinning of animals is generally performed by the butcher if they are slaughtered for food, and by the sweeper if they die a natural death. The method of skinning practised in the Punjab is as follows in the case of buffaloes or oxen. The carcase is first laid on the ground on its back; its legs are then held up and the hocks and hoofs are removed. A slit is then made in the skin along the full length, from the mouth to the tail; the skin on the inside of the hind-legs is also slit down to the root of the tail, and the skin of the fore-legs to the chest. The skin is then removed with a knife. When it has all been taken off one side the carcase is turned over and the skin of the other side is removed. The hide is then spread out on the ground and rubbed with salt, wood ashes or 'kalar' (saline efflorescence). It is then left to dry for a couple of days, being put in the sun in the cold weather and in the shade in the hot weather. The dried skins are then rolled up in bundles and put away in that state for sale or for future tanning. Sometimes, when the salt has been rubbed in, the skin is laid out flat on the ground, and a board ('chaukat') placed upon it so that the edges of the skin project all round. In these projecting portions of the hide holes are made, and a leather rope being passed through them, the skin is laced up tight on to the board. The board with the skin on it is then put up against a wall or some such place to dry.

In the case of sheep and goat skins, the method of skinning is first to remove the head and hang up by the hind legs to a convenient tree or a prepared tripod; slit open the skin on the inside of the hind-legs to the root of the tail; then draw the skin off whole, the hand alone (not a knife) being used to separate the skin from the flesh. A distinction is sometimes made between skins which have been removed by butchers and those taken off by village sweepers or Chamárs, the former being called 'qassábí' and the latter 'gánwári.'

The process of tanning the different kinds of skins varies considerably, and a separate description of the methods employed in each case is necessary. The general features of the system of tanning bull and buffalo hide are similar all over the Province, but slight variations of treatment occur in some districts, mostly owing either to the presence locally of some particular product which has been found useful for tanning purposes and which is not available elsewhere, or else to the difficulty of procuring some of the ordinary materials for tanning as used in other districts. There are a large number of distinct processes in tanning a skin of this class.

The first process is to steep the skin in water (generally in a village pond or 'chappar') for about twelve hours to soften the skin. This helps also to remove the salt if the skin is one which has been dried and salted,

and is not taken 'green' from the slaughter-house. It is then soaked in a vat [called 'baingar' (Siálkot), 'vegar' (Ráwalpindi), 'nand' (Rohtak)] containing generally a solution of lime and 'sajjí' (carbonate of soda). For 'sajji,' 'reh' or saline efflorescence is sometimes substituted. It remains in this solution some days to loosen the hair and to soften the surface of the skin, and should not be taken out until the skin becomes 'plumped up' and begins to be covered with a white fungoid growth, or as the natives say, until it becomes 'khamir' or ferments.

It is then taken out of this solution, and the third process is to remove with a 'fleshing knife' ('rambi,' 'ránpi,' 'khurpi'), the fat and inner skin ('jhilli,' 'gadúd,' 'chichra'). The outer hair is also taken off either with the same scraper or with a potsherd ('tikri') or piece of nitrified brick ('jhánwa'). The inner skin and fat which is removed is generally wasted, though it is sometimes employed as manure. It is never made use of in the Punjab for glue, as is done in England. Some dexterity is needed in removing the inner flesh, as the knife used has a sharpened edge, and a slip may shave too deep and cut into the hide.

The fourth process is to steep the skin, after being cleaned and scraped, in another vat ('nánd,' 'malni,' 'kún') containing the bark of the 'kikar' or 'bábul' tree (*Acacia arabica*). In the Hazára district the bark of the 'chir' (*Pinus longifolia*) is substituted for 'kikar' bark. Another variation also practised in the Hazára district is to substitute the leaves of the 'amla' (*Emblica officinalis*) or the root of the 'ber' (*Zizyphus jujuba*). The skin remains in this solution for three or four days. In the Gujránwála district, between the third and fourth processes as just described, there is an intermediate process which consists of steeping the skin in water mixed with leaves of the 'madár' (*Callotropis gigantia*) and 'pharwán' tree in order to remove all traces of the 'sajji' and lime. The fourth process is repeated three times, the skin being wrung thoroughly dry between each steeping and then placed in a fresh solution. The usual method of wringing a skin dry is to place it round a thick forked branch firmly embedded in the ground (called 'kasn'), and then twist it tightly with a stick so as to squeeze out all the moisture. These operations, which are gone through in order to remove all traces of lime from the skin, correspond to the English process of 'bating.' The use of lime in tanning is generally considered to be an evil, but a necessary one; it is not good for leather, but the hair and flesh must be removed, and there is no safer way of doing so. The plan of sweating the hides and producing partial decomposition, which is adopted in some places, would be too dangerous in a climate like that of India. After lime has done its work all traces of it in the texture of the hide have to be rapidly obliterated, and the process whereby this is effected in the English method is called 'bating,' the hides being thrown into a 'grainer' in which bran and water have fermented. The various mixtures described above as used for this fourth process take the place of the 'grainer.'

The skin after the third bath as above is washed, and then comes the fifth process. The skin is sewn up with 'munj' string in the shape of a sack and hung up on a tripod ('chará, 'trikáli') head downwards over a vat. The interior is then filled with the bark of the 'kikar' tree chopped fine, and water is poured on both inside and outside the skin. The mixture of water and bark is sometimes known as 'atura' or 'tarsa.' After some time (generally a period of about twelve hours), during which the skin has been kept constantly wetted, fresh water being poured in from the top as the old water trickles through the pores into the vat below, the skin is reversed in position, the opening which was at the top being sewn up, and a fresh small opening made in what is now the upper part of the skin-sack. The same process as before is now repeated, and this goes on for two or more days till the tannin has thoroughly penetrated the skin all over. During this watering process the same water is used over and over again, being taken up from the vat below as it drops into it. By this treatment the tannin goes right through the hide, but it has not time to make the chemical combination which, according to English ideas, is considered so essential for the leather. Tanning done in India on the English methods takes nine months to a year for a buffalo hide, four to six months for cow hides, and one to two months for sheep and goat skins. The above is a description of this process as generally practised, but there are many local variations and modifications of it in particular districts.

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The Leather Industry of the Punjab.—9 to 22. Leather Work (various).

1.—METAL WORK FROM MANIPUR.

1. Korphu of brass.
2. Kardan of bell-metal, 1 pair with silk tassel.
3. Kudaisel of bell-metal.
4. Kushi of copper.
5. Tami of copper.

2.—Metal Work from Sylhet.

1. Madhora of brass. 2. Chunati of bell-metal.
3. Dibi of bell-metal. 4. Batlai of bell-metal.

3.—Metal Work from Assam.

1. B'anbati, with top.

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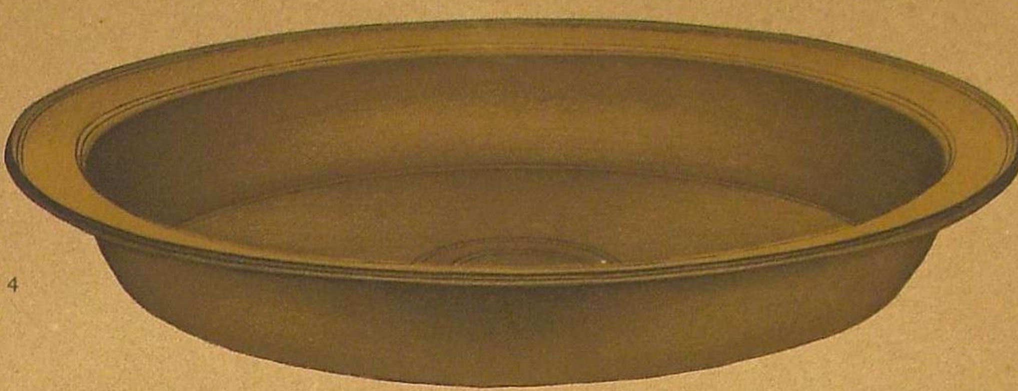

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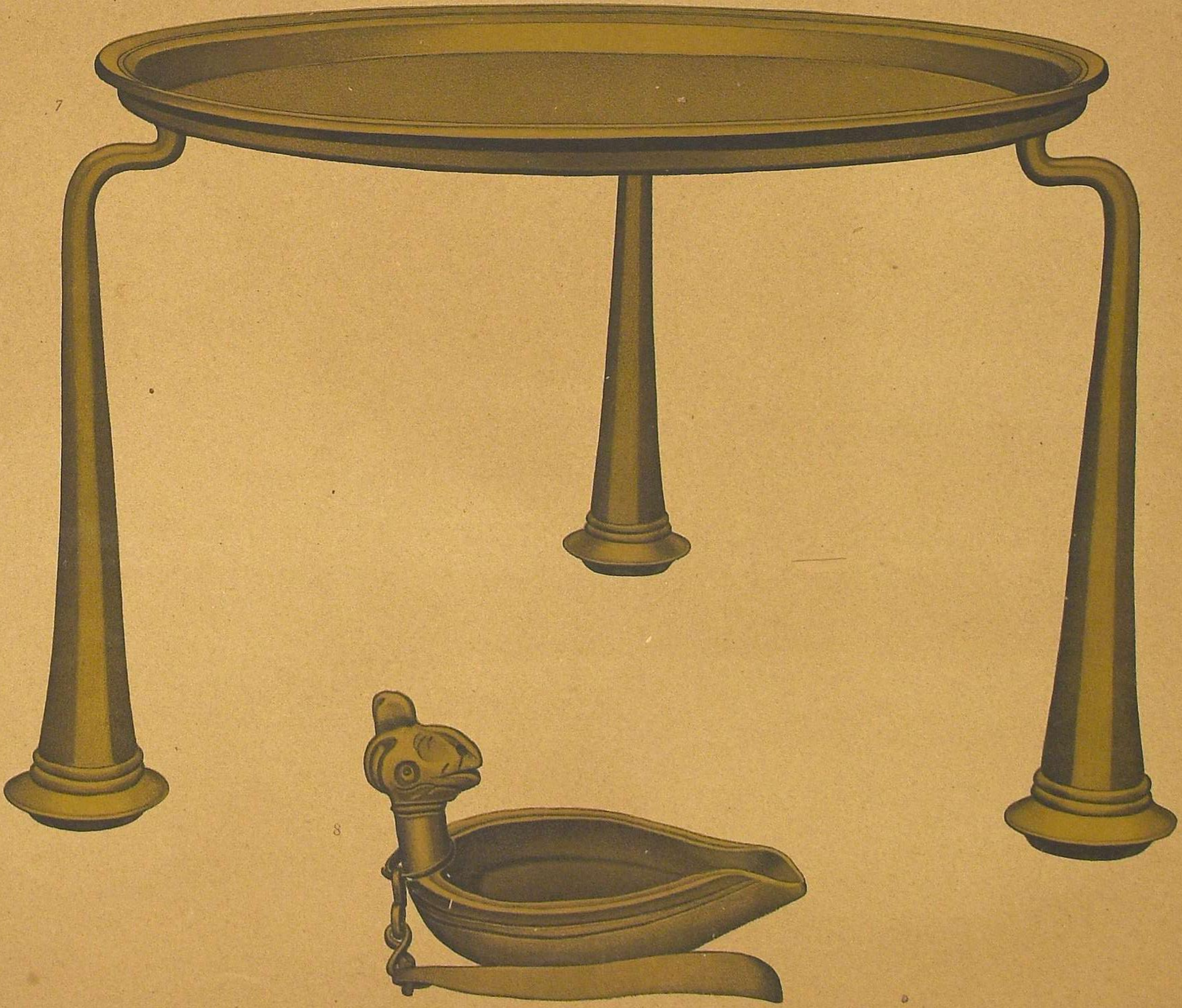
4.—METAL WORK FROM ASSAM.

2. Banthal. 3. Bota. 4. Pandhoa.

5.—Metal Work from Assam.

5. Tál (two). 6. Tema.



6.—Metal Work from Assam.

7. Brass Bera with a bell-metal Kahi on it. 8. Brass Chaki.

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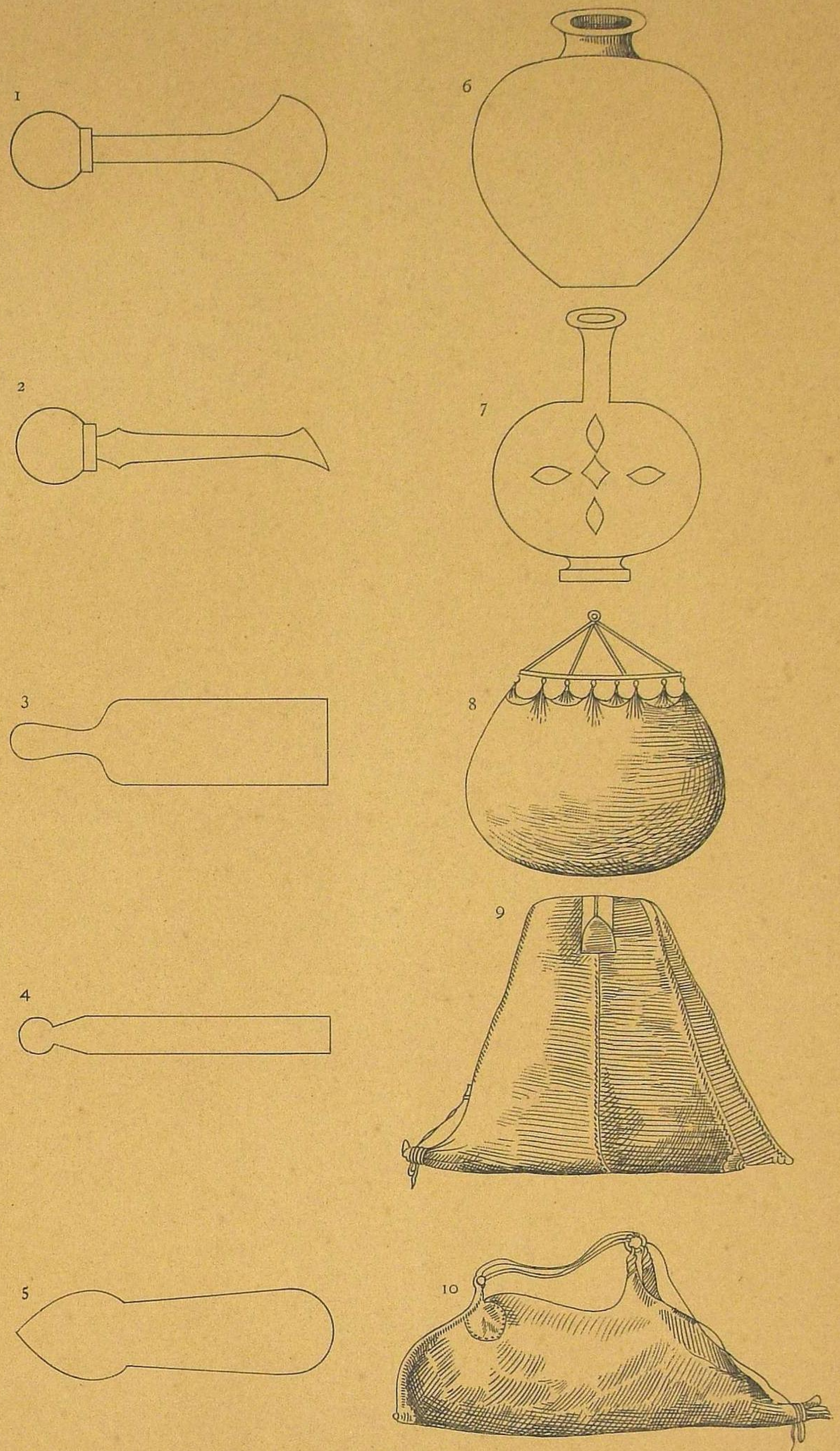
7.—Metal Work from Assam.

9. Brass Don. 10. Ghagari. 11. Koria.

8.—Metal Work from Assam.

12. Khorahi. 13. Sorai. 14. Temi.



9.—1. Rambí, large. 2. Rambí, small. 3. Munglí.
4. Wyáng. 5. Kalbút. 6. Kuppá.
7. Kuppí. 8. Charsah. 9. Pakhál.
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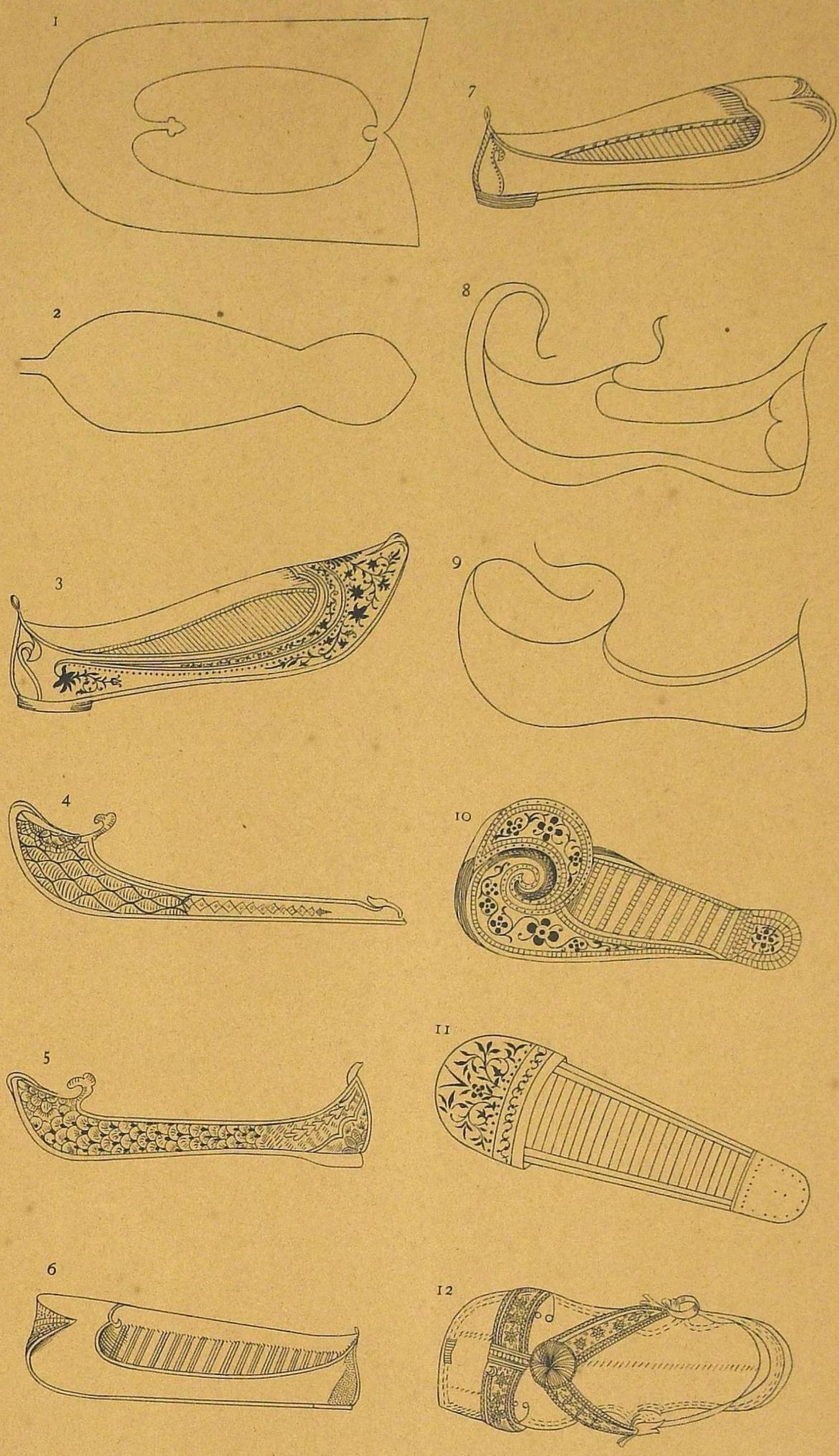

10.—1. Panna. 2. Talla. 3. Male salem sháhí (kámdár).

4. Ordinary female shoe. 5. Worn by females of high Musalmán families. 6. Golpanja, ordinary.

7. Golpanja for rough wear. 8. Pesháwarí. 9. Pothwár.

10. Ghetta. 11. Koff-pái. 12. Chaplí.

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12.—Shoes made at Delhi, Hoshiarpur, Rawalpindi, and Kangra.

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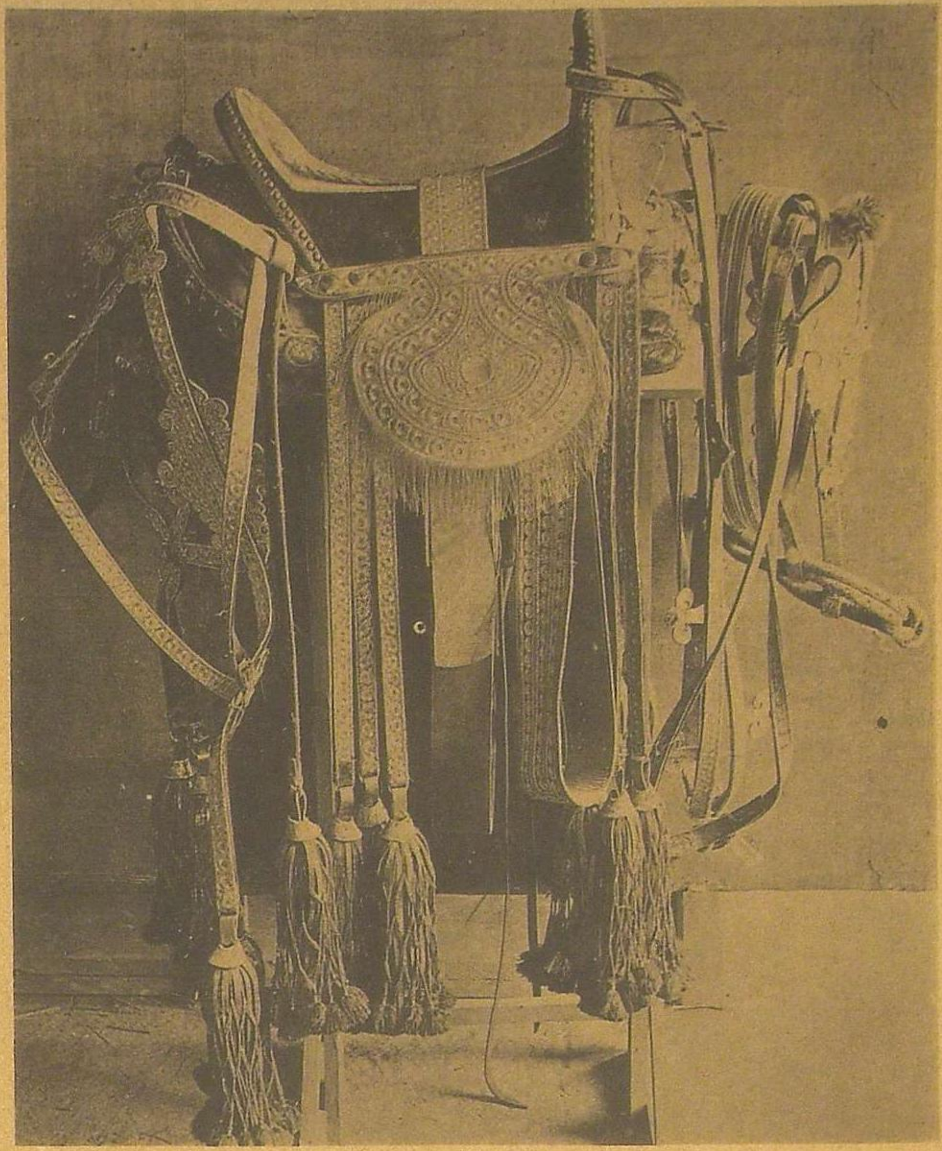
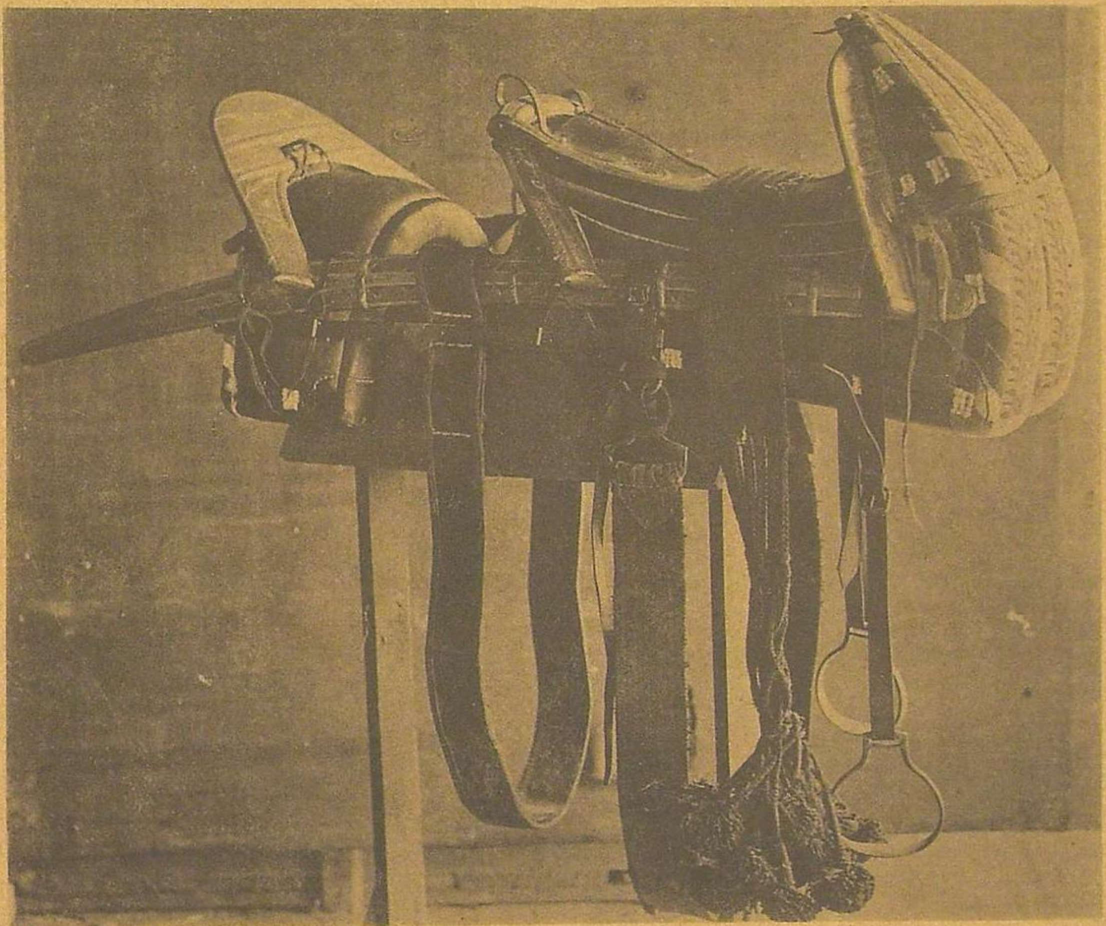
14.—Simla Quill and Leather Work.





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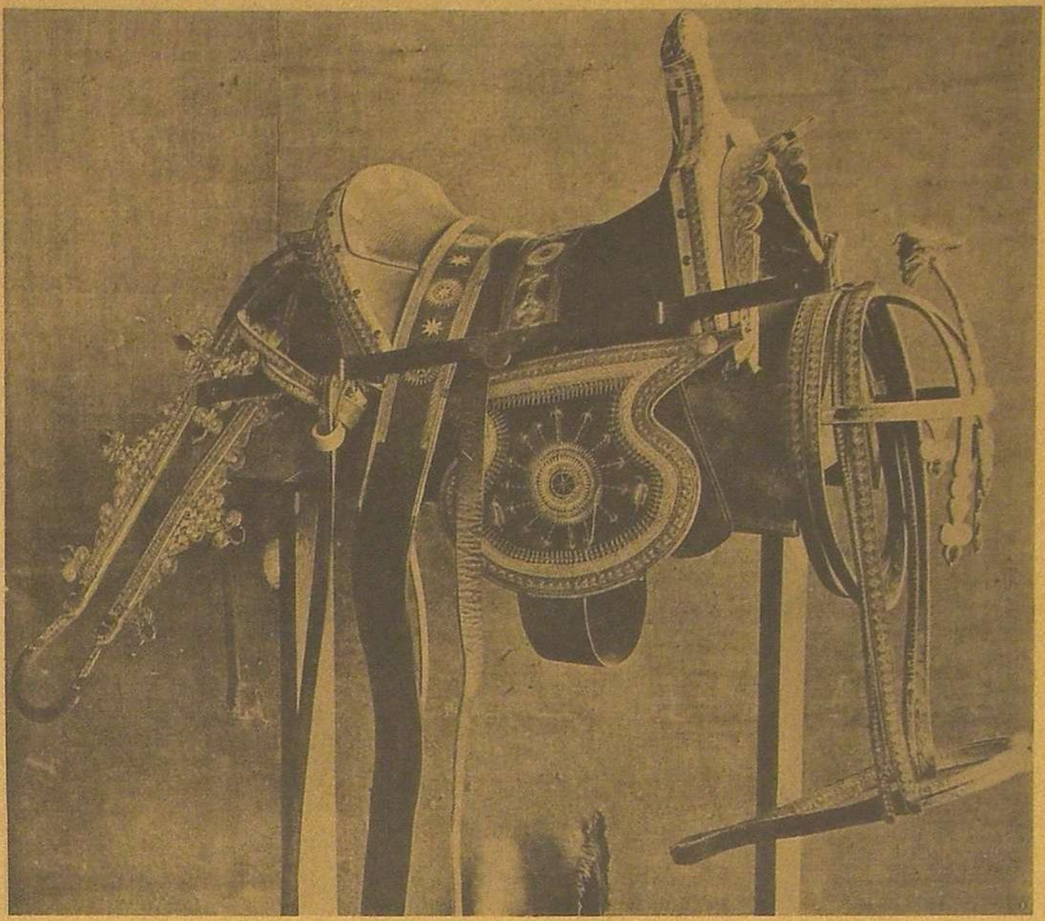

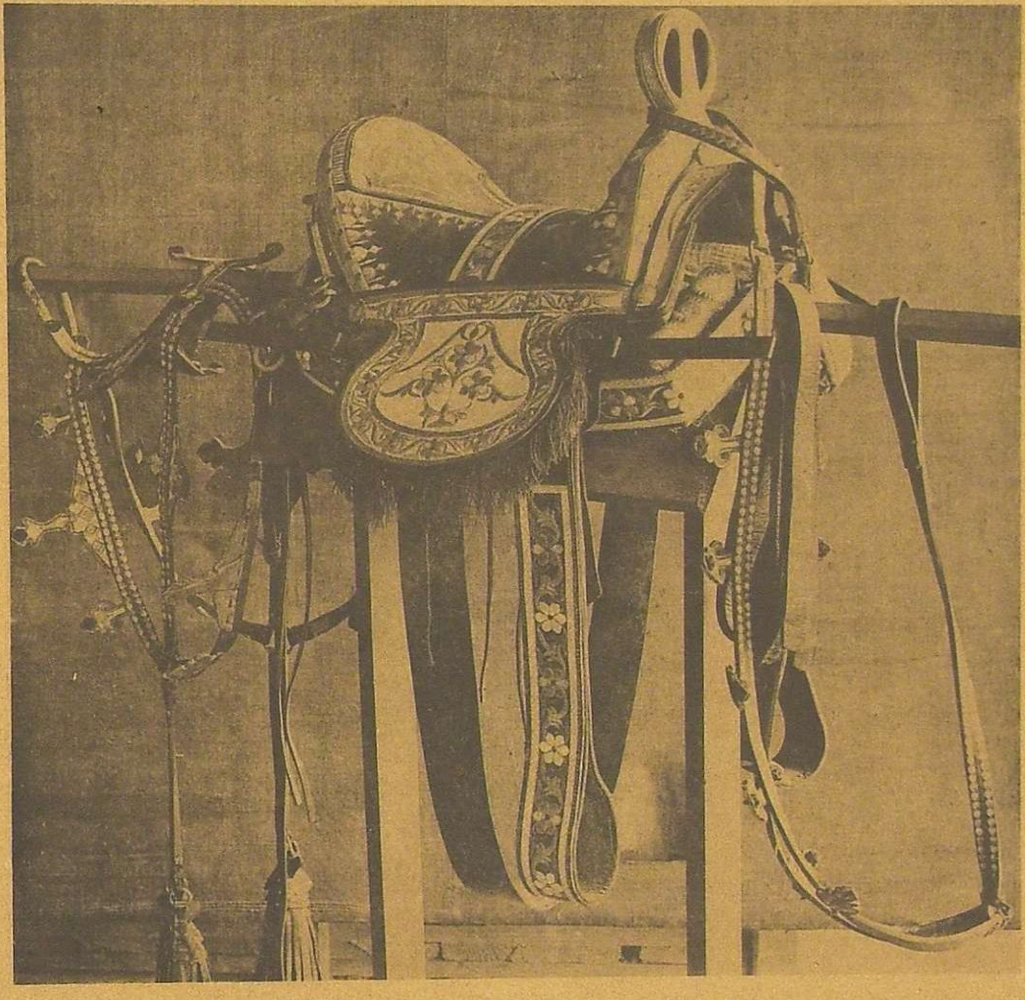

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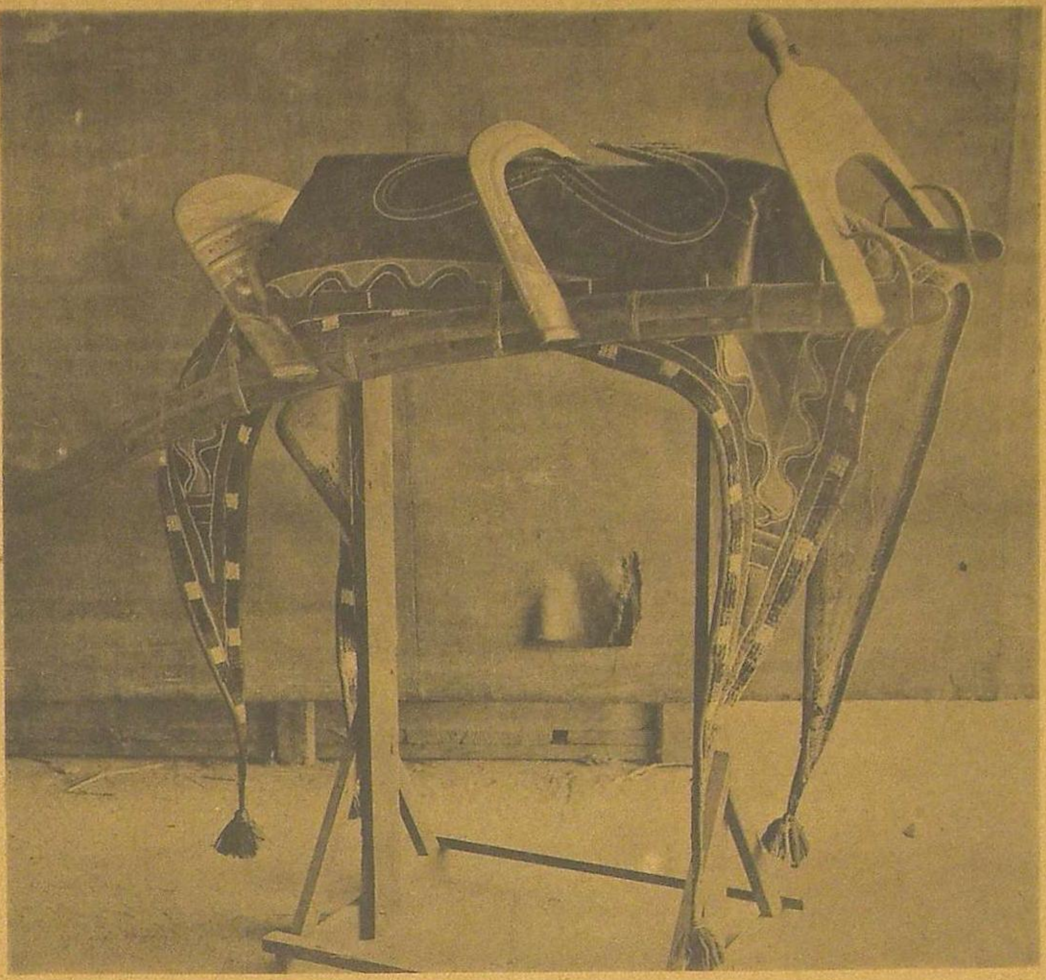

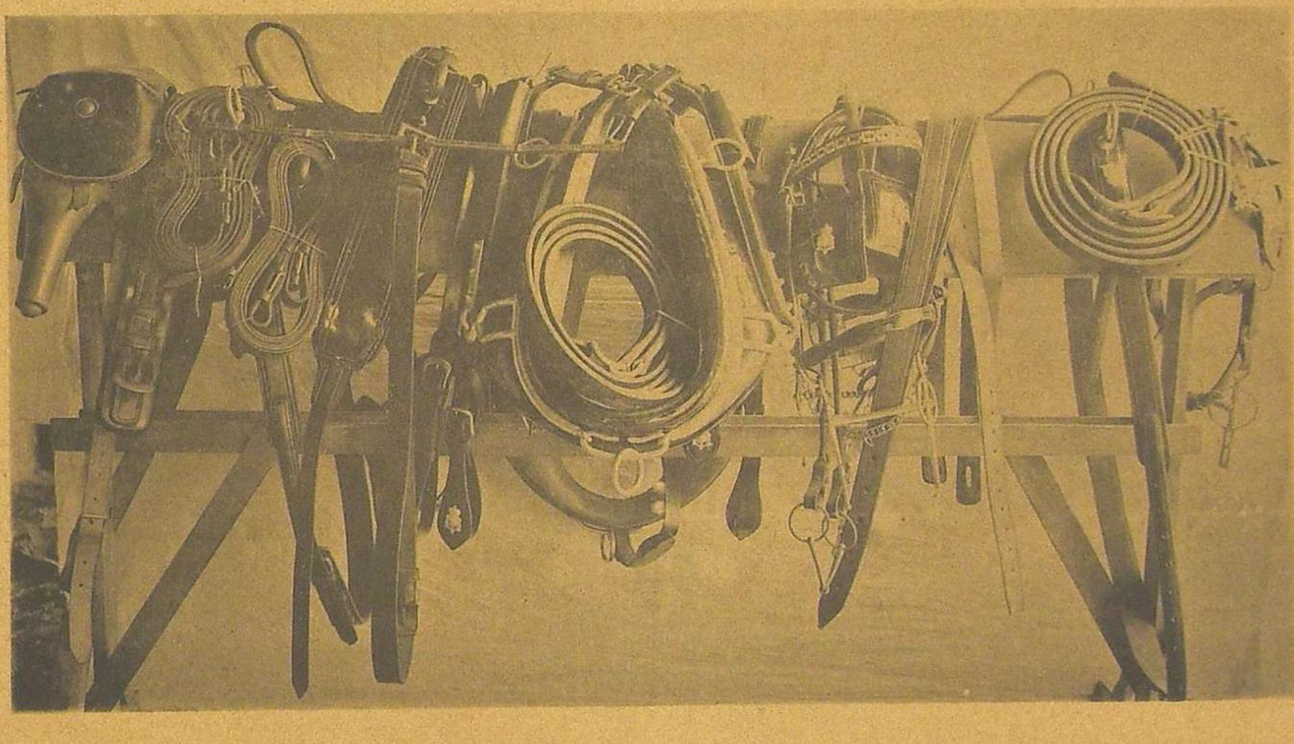

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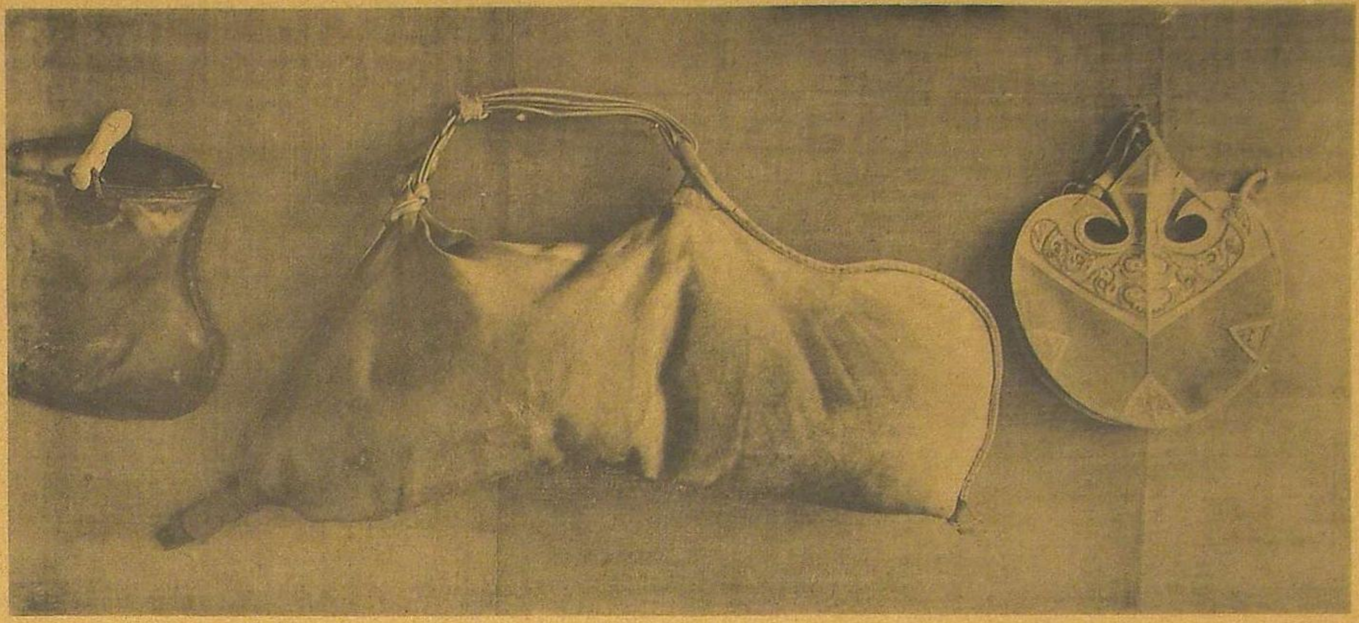

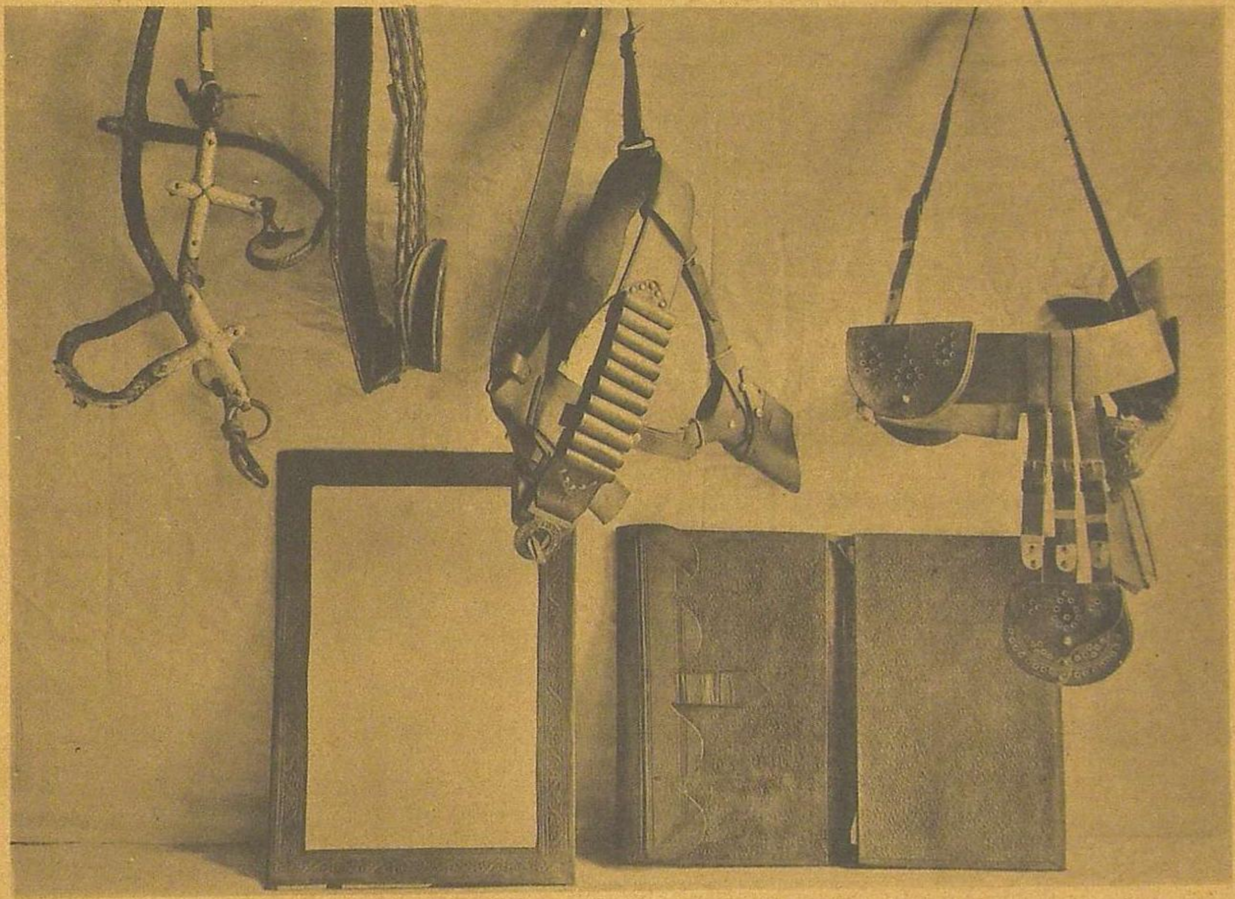

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